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HOME CAMP CREEK
PROPOSED RESEARCH NATURAL AREA
SIERRA NATIONAL FOREST

NOVEMBER, 1992

DEBORAH B. JENSEN

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ECOLOGICAL SURVEY OF THE PROPOSED
HOME CAMP CREEK RESEARCH NATURAL AREA
SIERRA NATIONAL FOREST, FRESNO COUNTY CALIFORNIA

Deborah B. Jensen
November 1992
(Purchase Order #43-9AD6-0-0327)

INTRODUCTION	3
JUSTIFICATION FOR ESTABLISHMENT	4
LOCATION AND ACCESS	5
PHYSICAL AND CLIMATIC CONDITIONS	5
Climate	6
Geology	7
Soils	7
Fire	8
VEGETATION AND FLORA	9
FAUNA	14
IMPACTS & POSSIBLE CONFLICTS	15
RECOMMENDATIONS	15
LITERATURE CITED	16
TABLES	20
FIGURES	24
MAPS	27
APPENDICES	33
PHOTOGRAPHS	42

INTRODUCTION

The Home Camp Creek candidate Research Natural Area (HCCRNA) is located in Fresno County, California in the Pineridge Ranger District of the Sierra National Forest. The area is within the Kaiser Wilderness and encompasses the lower two-thirds of Home Camp Creek, which is within the San Joaquin River drainage. HCCRNA was proposed by the Sierra National Forest in 1984.

This report provides ecological information on HCCRNA to assist the U.S. Forest Service in determining whether the area should be designated as a Research Natural Area (RNA). The HCCRNA as addressed by this report covers approximately 2450 acres (980 hectares) in the southwest corner of the Kaiser Wilderness. The recommended RNA is a combination of the areas included in the reconnaissance report, the RNA Nomination and the Sierra National Forest Land and Resource Management Plan (1992). This ecological survey addresses the suitability of the Home Camp Creek area as an RNA representing red fir and white fir target elements for the southern Sierra Nevada physiographic province. The results of this survey do not support designation of Home Camp Creek as an RNA to meet the white fir target element, but do support designation of the area as an RNA representative of red fir forest. The suitability of this site for RNA designation is dependent upon the choice of boundaries (see the discussion on boundaries, page 15).

The area was nominated as an RNA in 1984 by the Sierra National Forest Supervisor (Weaver 1984) as a representative of the white fir type (SAF 211) following a field reconnaissance (Anonymous 1984). The area is also included in the Sierra National Forest Land and Resource Management Plan (1992). These three documents include somewhat different boundaries for the Home Camp Creek candidate RNA (cRNA). The 1984 reconnaissance report states that the area is found in T8S R24E sections 4, 5, 8, 9 west and north of Home Camp Creek. The RNA Nomination includes a map delineating most of section 4, section 9 east of Home Camp Creek, the southeast quarter of section 10, and small parts of sections 15 and 16

in T8S R25E. The Forest Plan states that the area is found in T8S R23E sections 3, 4, and 9 and encompasses 1200 acres (480 ha). The Forest Plan map, however, shows that the area is in T8S R25E sections 4, 9, 10, and in T7S R25 E section 33. The boundaries addressed in this survey include all or a portion of sections 3, 4, 5, 8, 9, 10, 16, 17 T8S R25E MDM (Map 1). All further references in this document to HCCRNA are to this latter area.

JUSTIFICATION FOR ESTABLISHMENT

Red fir forests are characteristic of the upper montane zone of the Sierra Nevada. Red fir, *Abies magnifica*, is typically found on cold sites with long winters and high snow accumulation. Stands are dominated by long-lived, large-statured trees and the plant community typically contains only two layers, the overstory and a herbaceous community of very low cover (Oosting and Billings 1943, Rundel et al. 1977). Montane meadows often occur interspersed with the forest. Meadow vegetation and streamside communities greatly enrich the floristic diversity of red fir forest areas.

Home Camp Creek is a good example of red fir forests in the Sierra Nevada physiographic province (Photo 2). The majority of HCCRNA (90%) is dominated by red fir in stands representing a wide array of age-structures. In most stands the stocking is pure, as is typical of red fir forests, but there are also stands within the cRNA that include other conifer species as minor components. These reflect the array of different environments found within the cRNA from wet meadows, to dry ridges, to rocky outcrops, and from gentle to steep slopes.

On two southfacing slopes within the cRNA, white fir (*Abies concolor*) dominates. These stands total 128 acres (51.2 ha), only a small portion of the cRNA. White fir forests are typical of lower elevations, and more xeric conditions than red fir forests. There is insufficient acreage of white fir forest within the HCCRNA to justify its establishment as a representative of the white fir target in the Southern Sierran province. However, the presence of these white fir stands adds to the diversity of forest types associated with red fir that are present on HCCRNA. In addition, the HCCRNA also includes examples of montane meadows and lodgepole pine forests.

Red fir is one of the Southern Sierran province targets for the RNA program. Home Camp Creek cRNA provides an opportunity for the protection, research, and educational activities appropriate to a Research Natural Area. Ecosystem, species and genetic level research could readily be conducted here. For example, the presence of white fir within the cRNA presents an excellent opportunity for investigations into the environmental conditions that favor the establishment of white fir over red fir. Sensitive species are present in the cRNA. The cRNA is wintering area for the California spotted owl (*Strix occidentalis*) and home to *Hulsea brevifolia*, a plant on List 4 of the California Native Plant Society Inventory (Smith and Berg 1988).

LOCATION AND ACCESS

The HCCRNA is found on the western slope of the Sierra Nevada within the San Joaquin River watershed in the Pineridge Ranger District of the Sierra National Forest in Fresno County, California (Map 2). The area is roughly 50 miles northeast of Fresno and directly northwest of the western end of Huntington Lake approximately centered on longitude 119° 15' and latitude 37° 15'. HCCRNA is included on the USGS Musick Mountain, Huntington Lake, Kaiser Peak, and Mammoth Pool Dam 7.5' topographic quadrangles. The recommended boundary places the cRNA in T8S R35E, including portions of sections 3, 4, 5, 8, 9, 10, 16, and 17.

HCCRNA is easily accessible by travelling east from Fresno to Clovis via State Highway 168. From Clovis travel 63 miles (101 km) on Highway 168 to Lakeshore and the Huntington Lake Road. Travel west on Huntington Lake Road approximately 5 miles (8 km) to the Billy Creek Campground. The cRNA can then be reached by hiking north on the Billy Creek trail for 0.25 mile (0.4 km) and then following the Kaiser Loop trail southwest for 0.75 miles (1.2 km) to the Home Camp Creek trail. The Home Camp Creek trail proceeds through the center of the cRNA, and then turns west toward Coarsegrass Meadow, which is outside of the cRNA.

PHYSICAL AND CLIMATIC CONDITIONS

HCCRNA is within the Kaiser wilderness area, which was named for Kaiser Ridge, an east-west trending ridge of tall granitic peaks of 9000 to 10,300 feet (2720 m to 3120 m).

Kaiser Peak is 10,310 feet (3124 m). The drainages south of Kaiser Ridge, including Home Camp Creek (Photo 1), drain into Huntington Lake, a reservoir operated by Southern California Edison. Huntington Lake is on Big Creek, a tributary of the San Joaquin River. The HCCRNA does not include all of the watershed of Home Camp Creek. The headwaters, Nellie Lake, a popular camping and day hiking destination, is approximately one half mile (0.8 km) north of the northern boundary of the cRNA.

HCCRNA is nearly encircled by ridgelines that define the watershed. On the west, an extension of Kaiser Ridge bounds the cRNA (Photo 3); the eastern bound is the ridge separating Home Camp and Billy Creeks. To the north a granitic outcrop overlooks the watershed (Photo 4). The basin is open on the northeast where a tributary of Home Camp Creek enters and on the south where Home Camp Creek flows into Huntington Lake (Photo 5). The terrain within the cRNA includes gentle to moderate forested slopes in the lower portion of the Home Camp Creek watershed, while the upper portions of the basin have steeper slopes and rocky outcrops.

Within the red fir forest, steeper slopes and ridges often have more openings in the canopy, allowing herbaceous communities to develop on dry open areas of decomposed granite. Montane meadows have formed along some of the tributaries to Home Camp Creek, particularly in the areas with more gradual slopes.

Climate

The climate of the HCCRNA is typical for mid to high elevation areas in the western slope of the central Sierra Nevada. The growing season is short, with cold, wet winters and warm, dry summers. Most of the precipitation falls during the winter as snow, although snow in the high elevations is not uncommon in June or September. (For example, it snowed during the field survey of late June 1991). Summer precipitation occurs as late afternoon thunderstorms. Annual temperatures follow fairly consistent patterns, though the year-to-year precipitation varies greatly.

Climate records are available for Huntington Lake. This site is lower and therefore warmer and drier than the cRNA. Huntington Lake has an average temperature of 34 °F (1.1



PHOTO 12

°C) in January and an average of 61 °F (16.1 °C) in July. The average annual minimum temperature is 33 °F (0.6 °C), a reminder that this is a cold site where freezing temperatures are possible during any month of the year and are typical from October to May (US Dept of Commerce 1990). December, January, and February are the months with the highest average precipitation (State of California 1981). Table 1 gives the average monthly figures for temperature and precipitation at Huntington Lake.

Geology

The Sierra Nevada range is a large block that has been upthrust along its eastern fault escarpment and tilted westward. Most of the southern portion of the range is composed of granitic rocks of Mesozoic age (Bateman and Wahrhaftig 1966). These rocks, particularly in the high elevations, have been sculpted by glaciers leaving characteristic peaks, glacial cirques, high elevation lakes, and moraines. The high elevations of the Kaiser Peak Wilderness fit the common pattern of Central Sierran geologic history.

The geology of the Huntington Lake area was explored and mapped by Hamilton in the 1950s. The area is largely granitic; 12 distinct plutons of differing ages have been identified. The rocks of the HCCRNA are quartz diorite of the Kaiser Peak pluton, one of the oldest plutons in the Huntington Lake area. The Kaiser Peak pluton rocks are composed of quartz (20-35%), potassium feldspar (10-40%), and sodium plagioclase (25-50%) with 3-10% ferromagnesium minerals. Black Point, a Tertiary trachybasalt intrusion on the southern boundary of the HCCRNA, is one of four volcanic peaks in the Huntington Lake area. (Hamilton 1956) (Map 3).

Soils

The soils of the Kaiser Wilderness were just being mapped to subgroup by USFS staff during the ecological field surveys for HCCRNA (Map 4). The area is characterized by cold, young soils, as is typical of the higher elevations of the Sierra Nevada. The soils are coarse textured with high leach rates due to the granitic parent materials.

The lower elevations (7000-8300 feet (2120 - 2520 m)) in sections 4 and 9 in areas of low to moderate slopes (0-35%) are a complex of two different soils: a dystic cryochrept and a typic cryumbrept (map unit 1). The typic cryumbrept has dark colored top soils, often greater than seven inches (18 cm) in depth, that are rich in inorganics and have low base saturation. This soil typically has more vegetative cover and more annual plant cover than the cryochrept soils in this complex. The dystic cryochrept is an ochre colored soil, often with a shallower surface horizon and a weak B horizon. Both are cold soils. Higher elevations (8000-9500 feet (2420 - 2880m)) and steeper slopes (15-45%) also contain a complex of two soils. Here the dystic cryochrept is found in a complex with a typic cryopsamment (map unit 2). This second soil is a cold, coarse-textured entisol. Entisols are young soils, with little development of a soil profile (Taskey 1990).

To the west of Home Camp Creek the soils are on steeper slopes (25-60%) and are of the Cagwin family. These are dystic xero- or cryopsamments--cold, young, coarse- textured soils (map unit 3). In the northern part of the cRNA and approaching Jump Off Point are areas that have many rocky outcrops. They are properly classified as lithic xeropsamment complexes (map unit 4).

Fire

Periodic fire is a common process in many plant communities in the Sierra Nevada. Fire suppression has been implicated in the increasing frequency and cover of shade-tolerant and fire intolerant species such as white fir throughout the mid-elevation Sierran forests (Parsons and Debenedetti 1979, Kilgore and Taylor 1979). Fire is also important in red fir regeneration: seedling establishment follows after the canopy is opened by a crown fire (Kilgore 1971). Fire may be one of the environmental factors influencing the distribution of red fir and white fir forests. Some authors report that red fir is more fire tolerant than white fir (Parker 1986).

Fire is clearly a common factor in the HCCRNA. Old fire scars were evident on some of the larger individuals of red fir. The most recent fire, the "Lake Fire", burned an area along the Home Camp Creek trail, just above its crossing of Home Camp Creek, in 1988. The cause

of the fire is not certain, but once started, it was allowed to burn as was appropriate under the fire management policy in effect in 1988. The fire burned approximately 175-200 acres (70-80 ha) with little need for intervention (Desmond pers comm 1992). The fire was a slow-burning, ground fire that completely consumed several large trees leaving only cavities in the ground where the tree roots had been burned out (Photo 11-13). Many small trees, particularly white fir, were killed on the south facing slope above Home Camp Creek in section 4.

VEGETATION AND FLORA

I visited HCCRNA on July 10-13, 1990 and June 25-28 1991 accompanied by Joanna Cline (1990) and Scott Wilson (1990 and 1991). Qualitative evaluation of the cRNA was conducted by walking through the site, compiling a list of the flora and fauna encountered, and noting major topographic features and site conditions. Six plant communities were recognized during the qualitative evaluation: red fir forest, white fir forest, lodgepole pine forest, wet meadow, western white pine forest, and volcanic outcrop.

The vegetation was mapped from aerial photographs in conjunction with quantitative and qualitative field observations. Acreage was estimated using a dot-grid area scale. Map 5 shows the approximate boundaries of the plant communities of Home Camp Creek. Acreage estimates are in Table 2. Locations of the transects are noted on Map 6.

Plant species were identified in the field when possible. Voucher specimens were collected for all species for which field identification was questionable. Nomenclature follows Munz and Keck (1968). Plant species occurring in the cRNA are listed in Appendix 1. Where possible, vegetation types are named following Holland (1986).

Red Fir Forest (Holland Type 85310)

Red fir forest is a common high elevation forest type in the Coast Ranges, Klamath Mountains, Sierra Nevada, and Cascades. Red fir is usually found in pure stands (Photo 6), though associated conifer species often occur at low numbers under characteristic ecological conditions (Gordon 1980). For example, ridges and drier sites may include Jeffrey pine (*Pinus*

jeffreyi). Wet sites include lodgepole pine (*Pinus murrayana*) as an associate. High elevation and rocky sites include western white pine (*Pinus monticola*). At the lower elevational limits white fir (*Abies concolor*) and sugar pine (*Pinus lambertiana*) are found as associates.

The most common plant community in the Home Camp Creek cRNA, red fir forest covers 2042 acres (817 ha) of the 2450 acres (980 ha). It occurs in a wide array of stand ages and densities throughout the cRNA with many different ecological conditions represented. Quantitative measurements were made in both the red fir and the white fir forest. Three transects (two in red fir and one in white fir) were used to estimate the frequency, density, and basal area using the point-centered quarter method (Cottam and Curtis 1956). Distance and diameter at breast height (dbh) were measured for four trees at each of 20 points spaced 15 meters apart along a transect. Only those trees over two meters in height were counted in the overstory. The shrub and herb strata were sampled at each point using a one meter square grid. Additional estimates of frequency and basal area were made in other red fir stands using a Bitterlich angle gauge at ten points along a walking transect where points were twenty paces apart.

The lower elevations and shallower slopes west of Home Camp Creek contain both even and uneven aged stands of red fir. Transect 1 (see Table 3) is representative of stands with many age classes present (Figure 1) and significant regeneration. Small trees ($3.0 \text{ cm} < \text{dbh} < 10 \text{ cm}$) make up 61% of the trees sampled. Density is very high with nearly 1000 trees per hectare. At every sampling point the distance to the nearest sapling tree in each quarter was also measured. Ninety-five percent of these saplings ($\text{dbh} < 3.0 \text{ cm}$) were red fir, and the mean distance to a sapling from a sample point was 3.55 meters. In addition, red fir seedlings were the most frequent species found in the herbaceous quadrats at each sampling point. Only two trees in this transect were larger than 1 meter dbh.

The understory cover in the red fir forests throughout the cRNA is very low, 5.85% and 1.15% at transects 1 and 3 respectively (Table 4). This is consistent with other studies of red fir forest; Rundel et al. (1977) report that herbaceous cover of less than 5% is typical. The

characteristic species in the herbaceous layer are seedlings of *Abies magnifica*, *Viola purpurea*, *Pedicularis semibarbata*, and *Collinsia torreyi*.

One small population of *Hulsea brevifolia* (Photo 9) was found in the red fir forest above Home Camp Creek (NE 1/4 of section 9). This species is on List 4 of the California Native Plant Society's Inventory of Rare and Endangered Plant Species (Smith and Berg 1988).

The size structure of the stand in transect 3 is more typical of the larger mature red fir forests of the cRNA (Figure 2). The density of the stand is much lower, with 136 trees per hectare, and the basal area is 68.15 m²/ha. In this particular transect, white fir constitutes 22 % of the individuals in the stand and 30% of the basal area. These open stands, with many different age classes, are typical of the cRNA, though most stands are pure red fir without any white fir component. Sixteen percent of the trees in this transect were red fir larger than 1 meter dbh; the largest was 2.22 meters dbh.

In addition to regenerating stands and stands with many age classes, some portions of the cRNA have stands with large old trees. These old mature stands may include small patches of many densely packed young trees (Photo 7). For one stand in the southeast quarter of section 4 the estimated basal area of red fir was 72.68 m²/ha (using a Bitterlich angle gauge). The two other estimates of basal area (using a Bitterlich angle gauge) gave basal area estimates comparable to transects 2 and 3 of 51 m²/ha and 42.78 m²/ha respectively. These values are consistent with other studies such as Schumacher (1928), who reported basal area measures ranging from 52 m²/ha to 131 m²/ha.

Although most stands are nearly pure red fir, red fir intergrades with lodgepole pine forest along wet meadows and riparian areas. On the ridgelines and more arid sites, Jeffrey pine is often a minor component in the stands. Along the western boundary of the cRNA in section 8, the dry ridge area contains some interesting mixed stands of red fir and white fir (Photo 8). The ridge is at the upper elevational limit of white fir in the cRNA, and is windswept and drier than most pure red fir stands. Both Jeffrey pine and western white pine are present at low

frequencies. Because red fir and white fir are not commonly found in stands composed of equal numbers of both species (Barbour pers comm 1990), I sampled two randomly chosen 30 m by 30 m quadrats and simply counted the individual trees and saplings of each species. In one sample, white fir was 55 % of the stand, and in the second, white fir constituted 62% of the trees present (although only 29% of the saplings).

White Fir Forest (Holland Type 84240)

White fir, *Abies concolor*, is widely distributed over the western United States. In California, white fir is a mid-elevation species commonly found both in pure stands and as a significant component in mixed stands. A lower elevational species than red fir, white fir typically occurs on more xeric sites than red fir, and the ecotone between the two is relatively narrow (Pavlik and Barbour 1991).

White fir forest is not abundant within the cRNA; only two areas totalling 128 acres (51.2 ha) are dominated by white fir. Both areas are south facing slopes at elevations below 8000 feet (2420 m). The stand in section 9 in the southern portion of the cRNA is larger and contains some tree species also found in mixed conifer stands such as Jeffrey pine and sugar pine. The small stand north of Home Camp Creek in section 4 is really a narrow band where white fir dominates within what is otherwise a red fir forest. A portion of this stand was burned in the Lake Fire in 1988. Many small white firs were killed by the fire, but it did not kill the large individuals.

A three-hundred-meter transect in the lower white fir stand indicated that within Home Camp Creek cRNA the white fir forest is characterized as having an open-stand structure with fairly wide spacing between the trees. The understory vegetation is more abundant than in red fir stands; average cover by shrubs is 14% and average cover by herbaceous species is only 3.95%. Mountain whitethorn, *Ceanothus leucodermis*, and chinquapin, *Chrysolepis sempervirens*, are the most common shrubs in the understory (Table 4). The understory species composition of the white fir forest is distinct from that of the red fir forest.

↑
C. cordulatus
(not
leucodermis)

The density in this stand is 239 trees per hectare (Table 3) and the basal area is 48 m²/ha. There is little evidence of significant regeneration. Only 14% of the individuals were in the smallest size class (Figure 3) and unlike the red fir forest there are very few individuals smaller than sapling size (> 3.0cm dbh) within the stand. There were only a few large individuals--most trees are less than 1 meter in dbh, although one tree measured in the transect was 1.76 m dbh.

Lodgepole Pine Forest (Holland Type 86100)

Lodgepole pine is a widespread forest type in California (Pfister and McDonald 1980, Bartolome 1988). In HCCRNA lodgepole pine forest is found in cool, moist areas around meadow margins and streams. The stands are mainly even-aged and may have shrubs such as *Ledum glandulosum* or dense meadow vegetation as the understory. The stand in section 5 has a dense understory of *Ledum*. No quantitative measurements were taken in this type.

The area mapped as lodgepole pine forest on the upper reach of Home Camp Creek within the cRNA contains a mixture of lodgepole pine forest and rich wet meadows interlaced with stream channels. The lodgepole pine forest here intergrades with the surrounding red fir forest as the soils get drier. Similarly the lodgepole forest in the southern portion of the cRNA is a mixture of open lodgepole stands and wet meadows.

Western White Pine Forest

Western white pine forest is not often recognized as a distinct plant association in California vegetation classifications, probably because western white pine forests typically occur in fairly small stands, and the stands are rarely pure *Pinus monticola*. Holland's (1986) Sierran Mixed Subalpine Coniferous Forest (86200) includes this plant community as does SAF type 256 (California Mixed Subalpine, Parsons 1980).

In HCCRNA western white pine forest is restricted to a small area (79 acres (31.6 ha)) on the rocky outcrops in the southeast quarter of section 4. These stands are fairly open, with a significant component of red fir. The understory has more cover than in any of the other forest types within HCCRNA except lodgepole pine forests. Shrubs species such as *Arctostaphylos*

nevadensis, *Chrysolepis sempervirens*, and *Holodiscus microphyllus* are interspersed with herbaceous species such as *Monardella odoratissima*, *Sitanion hystrix*, *Brodiaea lutea*, *Silene montana*, and *Erysimum perenne*. No quantitative measures were taken in this type.

Montane Meadow (Holland Type 45100)

Several meadow areas are found within the cRNA (Photo 10). The total meadow acreage is estimated to be 88 acres (35.2 ha), although this represents 5 separate meadow areas. As in most high elevation areas of the Sierra Nevada, the montane meadows are the most floristically rich areas in the cRNA. Some of the meadows are bordered by lodgepole pine forest, and others by red fir forest. The common meadow species include: *Carex nebrascensis*, *Danthonia intermedia*, *Deschampsia elongata*, *Aster alpigenus* ssp. *Andersonii*, *Hypericum anagalloides*, *Ranunculus alsimaefolius*, and *Mimulus primuloides*.

Narrow stringer meadows are also found along the streams. Many species are common to both the flat meadows with saturated soils and the stringers. The common stream-side associates include *Angelica breweri*, *Castilleja miniata*, *Arnica longifolia*, *Habenaria dilatata*, *Habenaria sparsiflora*, *Mertensia ciliata*, and *Mimulus guttatus*.

FAUNA

Wildlife species likely to occur in Home Camp Creek cRNA were identified using the Wildlife Habitat Relationships Data Base from the Department of Fish and Game. This list is included in Appendix 2, with those species observed during the field surveys noted.

Home Camp Creek provides habitat suitable for the California spotted owl; the great gray owl (*Strix nebulosa*), a state listed endangered bird; and the wolverine (*Gulo gulo*), a state listed rare mammal. Sensitive species that may occur in the cRNA include the northern goshawk (*Accipiter gentilis*) and the marten (*Martes pennanti*).

IMPACTS AND POSSIBLE CONFLICTS

Home Camp Creek cRNA lies within the Kaiser Wilderness Area. RNA and Wilderness Area designations are compatible and pose no conflicts with the establishment and management of the RNA. The hiking trail along Home Camp Creek receives moderate use from numerous visitors to Huntington Lake. The Billy Creek trail receives more use because of the attraction of going to Nellie Lake. There was little evidence of adverse impacts resulting from use of the Home Camp Creek trail. On the weekdays during which the field work was conducted no visitors were encountered. The Kaiser Wilderness Area already has a quota system to help manage the recreational use of the area. If necessary the existing quota and wilderness-permit system could be used to assure minimal impacts to the RNA due to use of the trails by wilderness visitors.

Livestock grazing still occurs within HCCRNA. While there in 1990, I saw evidence of livestock grazing in some of the higher meadows within the cRNA. There were also signs of cattle use in other forested areas of the cRNA. Continuance of the existing grazing permits could pose conflicts with maintaining the natural values of the montane meadows.

RECOMMENDATIONS

The boundary questions must be resolved to design a suitable RNA. The reconnaissance report recommends the area to the west of Home Camp Creek; the Forest Supervisor and the Sierra National Forest Land and Resource Management Plan recommend the areas to the east of Home Camp Creek. All recommend the area to the north. The boundaries recommended for Home Camp Creek cRNA by this ecological survey are shown in Map 1 and Map 6. These boundaries represent an addition of approximately 920 acres (368 ha) to the 1530 acres (612 ha) recommended by at least one of the other three documents. The primary reasons for this addition are for the age-structure diversity of red fir stands found within the larger RNA, and for the ecological integrity of an RNA designed to incorporate watershed boundaries where possible. The other boundaries proposed all use Home Camp Creek as one boundary, thereby overlooking the value of including the aquatic ecosystem of the creek itself into the considerations for designing RNA boundaries. Limiting the RNA to only the western portion

of the watershed incorporates red fir forest, but loses the research opportunities presented by the red fir/white fir ecotone present at several places in the eastern portion of the RNA. The environmental control of the boundary between red and white fir forests is an active and unresolved area of research. The proposed boundaries follow the ridgelines on the south, east, and west wherever possible, and incorporate the rocky outcrop containing western white pine in the northern portion of the area.

I recommend the establishment of the Home Camp Creek cRNA as a representative example of red fir forest in the southern Sierra Nevada. Home Camp Creek is not an appropriate site for an RNA to represent white fir forest as there is too little acreage of this type within the cRNA. The existing acreage of white fir within the cRNA does provide some valuable ecotone areas between red and white fir forests. Establishment of Home Camp Creek would help to preserve the ecological and genetic integrity of this representative example of red fir forest and its associated communities, and provide an opportunity for baseline research for understanding the natural processes of these plant communities.

LITERATURE CITED

Anonymous. 1984. Field reconnaissance report on Home Camp Creek cRNA. On file at USFS PSW Station in Albany, CA.

Bateman, P.C. and C. Wahrhaftig. 1966. Geology of the Sierra Nevada. Pages 107-172 In: E. Bailey (ed.) Geology of Northern California. California Division of Mines and Geology Bulletin 190.

Barbour, M. G. 1990. Department of Botany. University of California, Davis. Personal communication.

Bartolome, J. W. 1988. Lodgepole Pine. In: A Guide to Wildlife Habitats of California. K.E. Mayer and W.F. Laudenslayer eds. Calif. Dept. of Forestry and Fire Protection. p 44-45.

Cottam, G. and J.T. Curtis. 1956. The use of distance measures in phytosociological sampling. *Ecology* 37: 451-460.

Desmond, J. 1992. Personal communication. Pine Ridge District, Sierra National Forest.

Gordon, D.T. 1980. Red Fir. In: *Forest Cover Types of the United States and Canada*. Eyre, F.H. (ed). Society of American Foresters. Washington, D.C. pp 87-88.

Hamilton, W.B. 1956. *Geology of the Huntington Lake Area, Fresno County, California*. Special Report No. 46. California Division Mines, San Francisco, CA.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game. Sacramento, CA. Unpublished mimeo.

Kilgore, B.M. 1971. The role of fire in managing red fir forests. *Trans. N. Am. Wildl. Nat. Resour. Conf.* 36: 405-416.

Kilgore, B.M. and D. Taylor. 1979. Fire history of a sequoia-mixed conifer forest. *Ecology* 60: 129-142.

Kuchler, A.W. 1977. The map of the natural vegetation of California. In: *Terrestrial Vegetation of California*. M.G. Barbour and J. Major (eds). John Wiley and Sons. New York. 909-938.

Munz, P.A. and D.D. Keck. 1968. *A California Flora, with supplement*. University of California Press. Berkeley.

Oosting, H.J. and W.D. Billings. 1943. The red fir forest of the Sierra Nevada: *Abietum magnificae*. *Ecol. Monogr.* 13: 259-274.

Parker, A.J. 1986. Environmental and historical factors affecting red and white fir regeneration in ecotonal forests. *Forest Science* 32(2): 339-347.

Parsons, D.J. 1980. California Mixed Subalpine. In: *Forest Cover Types of the United States and Canada*. Eyre, F.H. (ed). Society of American Foresters. Washington, D.C. pp 90-91.

Parsons, D.J. and S.H. DeBenedetti. 1979. Impact of fire suppression on a mixed-conifer forest. *Forest Ecology and Management* 2: 21-33.

Pavlik, B.M. and M.G. Barbour. 1991. Seasonal patterns of growth, water potential and gas exchange of red and white fir saplings across a montane ecotone. *Am. Midl. Natur.* 126: 14-29.

Pfister, R.D. and P.M. McDonald. 1980. Lodgepole Pine. In: *Forest Cover Types of the United States and Canada*. Eyre, F.H. (ed). Society of American Foresters. Washington, D.C. pp 97-98.

Rundel, P.W., D.J. Parsons, and D.T. Gordon. 1977. Montane and subalpine vegetation of the Sierra Nevada and Cascade Ranges. In: *Terrestrial Vegetation of California*. M.G. Barbour and J. Major (eds). John Wiley and Sons. New York. 559-600.

Schumacher, F.X. 1928. Yield, stand, and volume tables for red fir in California. *Univ. Calif. Agric. Exp. Sta. Bull.* 407. 26 p.

Sierra National Forest Land and Resource Management Plan. 1992. USDA Forest Service Pacific Southwest Region. San Francisco.

Smith, J.P. Jr. and K. Berg. 1988. *Inventory of Rare and Endangered Vascular Plants of California*. California Native Plant Society. Special Publication No. 1, 4th edition. Sacramento, CA.

State of California. 1981. California Rainfall Summary. Total Monthly Precipitation. 1949-1980. California Department of Water Resources. Sacramento, CA.

Taskey, Ron. 1990. Soil scientist, Sierra National Forest. Personal communication.

United States Dept of Commerce. 1990. Climatological Data. Annual summary. Vol 94 No 13.

Weaver, W.S. 1984. Research Natural Area Proposal from Sierra National Forest. On file at USFS PSW Station in Albany, CA.

Table 1. Long term average monthly rainfall and temperatures for Huntington Lake.

	Mean Monthly Precipitation		Mean Monthly Minimum Temp		Mean Monthly Maximum Temp	
	Inches	Cm	° F	° C	° F	° C
Jan	5.95	15.11	23	-5	44	6.6
Feb	6.34	16.1	23	-5	45	7.15
Mar	5.00	12.7	23	-5	45	7.15
Apr	3.3	8.38	28	-2.2	50	9.9
May	1.64	4.17	34	1.1	56	13.2
Jun	0.55	1.40	41	4.95	66	18.7
Jul	0.17	0.43	48	8.8	74	23.1
Aug	0.23	0.58	47	8.25	73	22.55
Sep	0.82	2.08	43	6.05	67	19.25
Oct	1.67	4.24	36	2.2	59	14.85
Nov	3.24	8.23	29	-1.65	50	9.9
Dec	5.54	14.07	25	-3.85	44	6.6
Annual Average	34.43	87.45	33	0.55	56	13.2

Table 2. Area of plant communities of Home Camp Creek cRNA. Names and numbers are given for Holland, SAF, and Kuchler equivalents.

Plant Community	Holland Type (1986)	SAF Type (1980)	Kuchler Type (1977)	Acres	Hectares
Red Fir Forest	Red Fir Forest (85310)	Red Fir (207)	Upper Montane Subalpine Forest (17)	2042	816.8
White Fir Forest	Sierran White Fir Forest (84240)	White Fir (211)	Sierran Montane Forest (15)	128	51.2
Lodgepole Pine Forest	Lodgepole Pine Forest (86100)	Lodgepole Pine (218)	Upper Montane Subalpine Forest (17)	94	37.6
Western White Pine Forest	—	California Mixed Subalpine (256)	Upper Montane Subalpine Forest (17)	79	31.6
Montane Meadow	Montane Meadow (45100)	—	—	88	35.2
Rocky outcrop	—	—	—	19	7.6
Total acreage				2450	980

Table 3. Frequency, density, basal area and dominance of trees in Home Camp Creek cRNA.

	Transect 1	Transect 2	Transect 3
Mean distance between trees in meters	3.15	6.42	8.57
<i>Abies magnifica</i>			
Frequency	0.95	0.01	0.78
Density (trees per hectare)	982.20	3.0	106.48
Mean basal area in cm ²	1067.64	166.2	4930.47
Dominance (ba in m ² /ha)	104.88	0.05	52.50
<i>Abies concolor</i>			
Frequency	0	0.99	0.22
Density (trees per hectare)	0	239.4	29.67
Mean basal area in cm ²	0	2018.56	5274.06
Dominance (ba in m ² /ha)	0	48.33	15.65
<i>Pinus murrayana</i>			
Frequency	0.05	0	0
Density (trees per hectare)	51.7	0	0
Mean basal area in cm ²	23.58	0	0
Dominance (ba in m ² /ha)	0.12	0	0
Transect totals			
Density (trees per hectare)	1033.5	242.41	136.15
Total basal area (in m ² /ha)	104.98	48.37	68.14

Table 4. Frequency and cover data for shrubs and herbaceous species in 1 meter quadrats in the Home Camp Creek basin. Frequency indicates the proportion of quadrats that contained each species. Cover indicates the average cover of that species in the transect.

	Transect 1 Red Fir		Transect 2 White Fir		Transect 3 Red Fir	
Percent of plots with herbs or shrubs	65		80		35	
Average Cover	5.85		18.05		1.15	
Species name	freq	mean % cover	freq	mean % cover	freq	mean% cover
<i>Abies magnifica</i> seedlings	0.55	3.55			0.15	0.2
<i>Apocynum pumilum</i>			0.05	0.05		
<i>Arabis</i> sp	0.05	0.05				
<i>Aster alpigenus</i>			0.15	1.85		
<i>Bromus carinatus</i>			0.25	0.8		
<i>Calyptridium umbellatum</i>	0.1	0.3			0.05	0.15
<i>Calystegia malacophylla</i>			0.1	0.4		
<i>Ceanothus leucodermis</i>			0.1	7.0		
<i>Chyrsolepis sempervirens</i>			0.2	6.25		
<i>Chyrsopsis breweri</i>	0.05	0.25				
<i>Collinsia torreyi</i>	0.05	0.05			0.15	0.35
<i>Eriogonum nudum</i>	0.05	0.05				
<i>Gayophytum nutalli</i>	0.1	0.1	0.05	0.1		
<i>Hackelia</i> sp.			0.1	0.1		
<i>Hieracium albiflorum</i>	0.05	0.25			0.05	0.05
<i>Lupinus breweri</i>					0.1	0.3
<i>Pedicularis semibarbata</i>	0.25	0.55			0.05	0.05
<i>Phlox diffusa</i>	0.05	0.05				
<i>Prunus emarginata</i>			0.1	0.85		
<i>Stipa occidentalis</i>	0.1	0.3				
<i>Stellaria jamesiana</i>	0.1	0.3	0.2	0.6		
<i>Viola purpurea</i>	0.05	0.05	0.05	0.05	0.05	0.05
Totals	1.55	5.85	1.35	18.05	0.6	1.15

Figure 1

Size distribution of trees

Transect 1

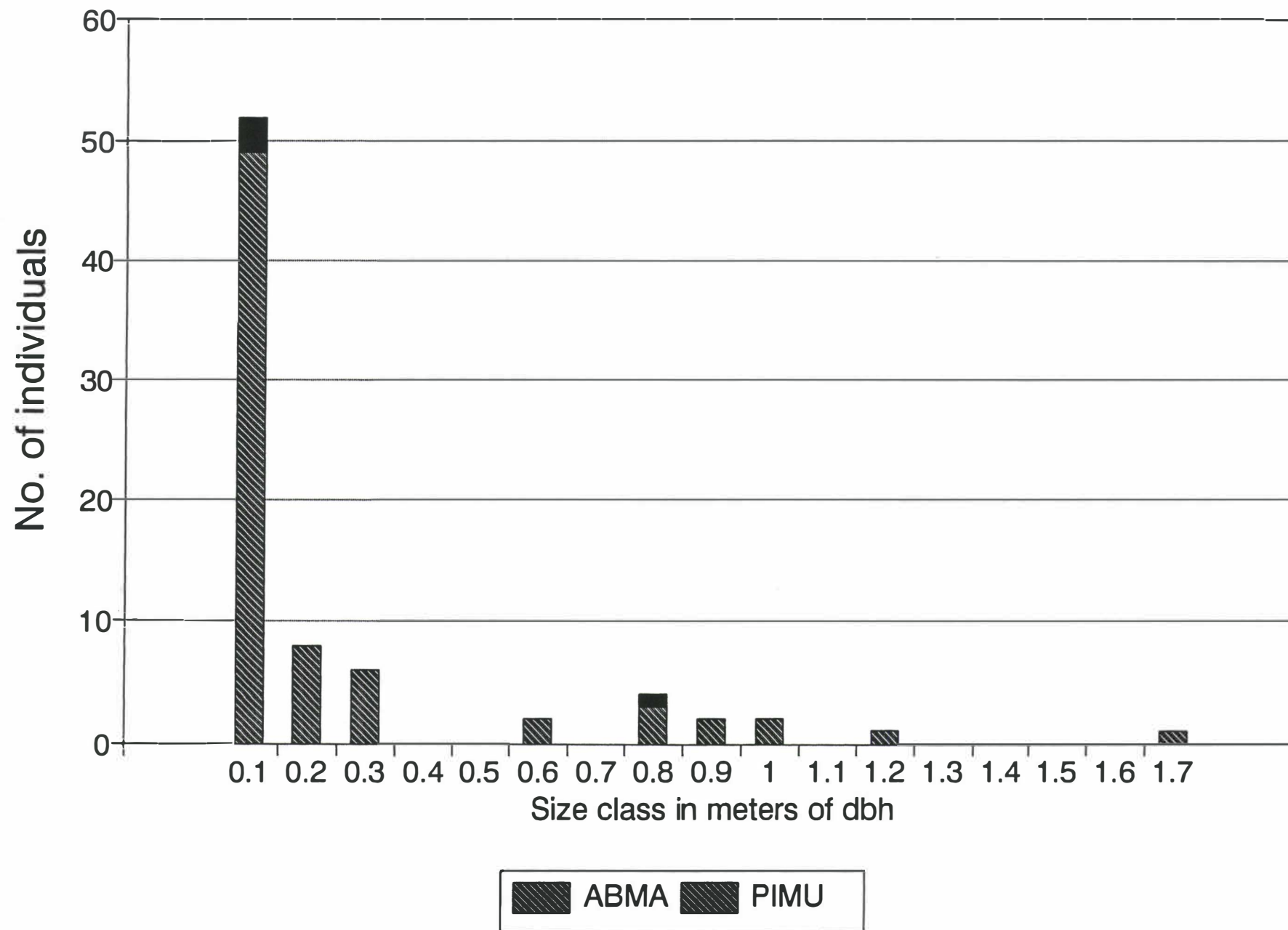


Figure 2

Size distribution of trees Transect 3

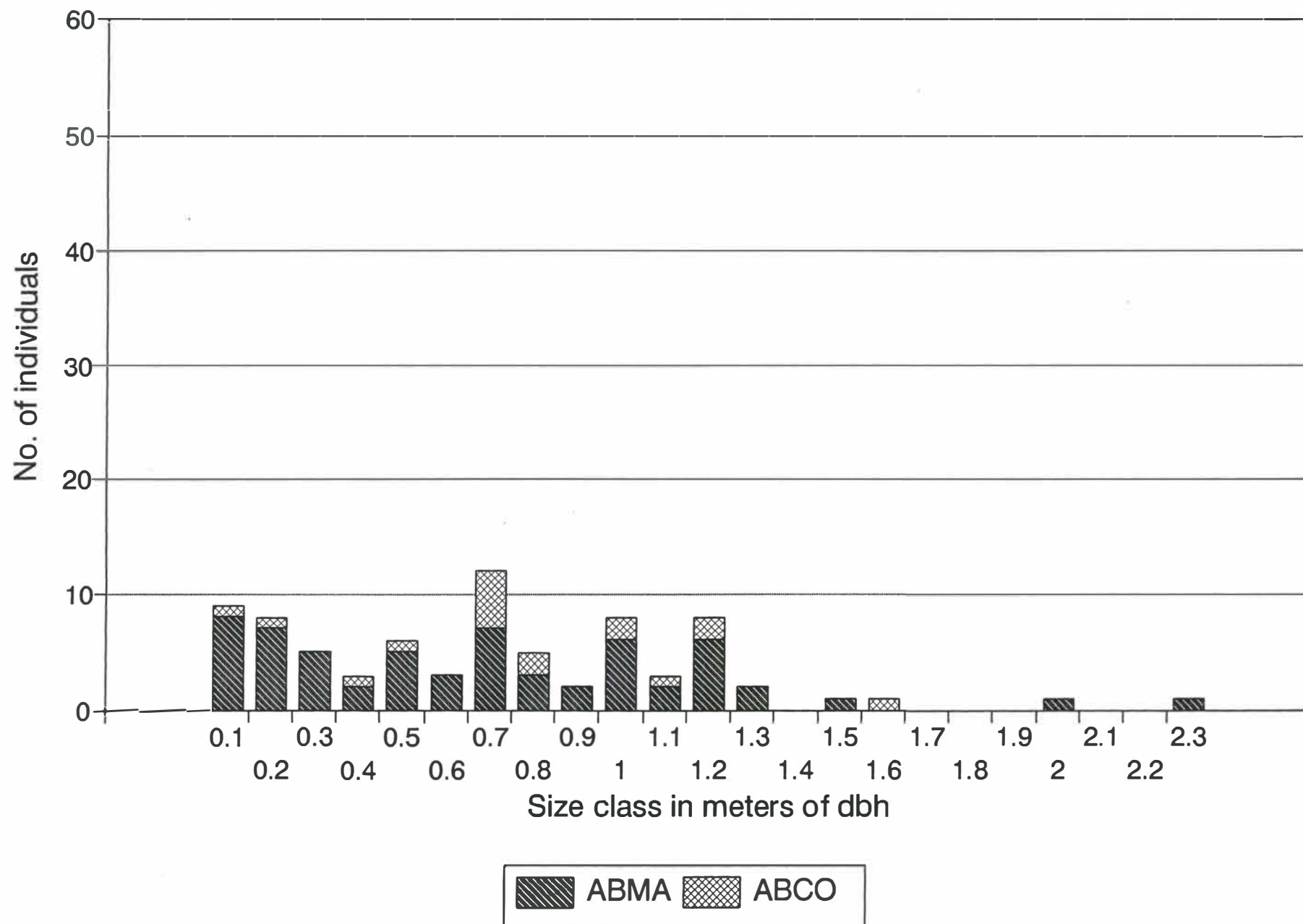
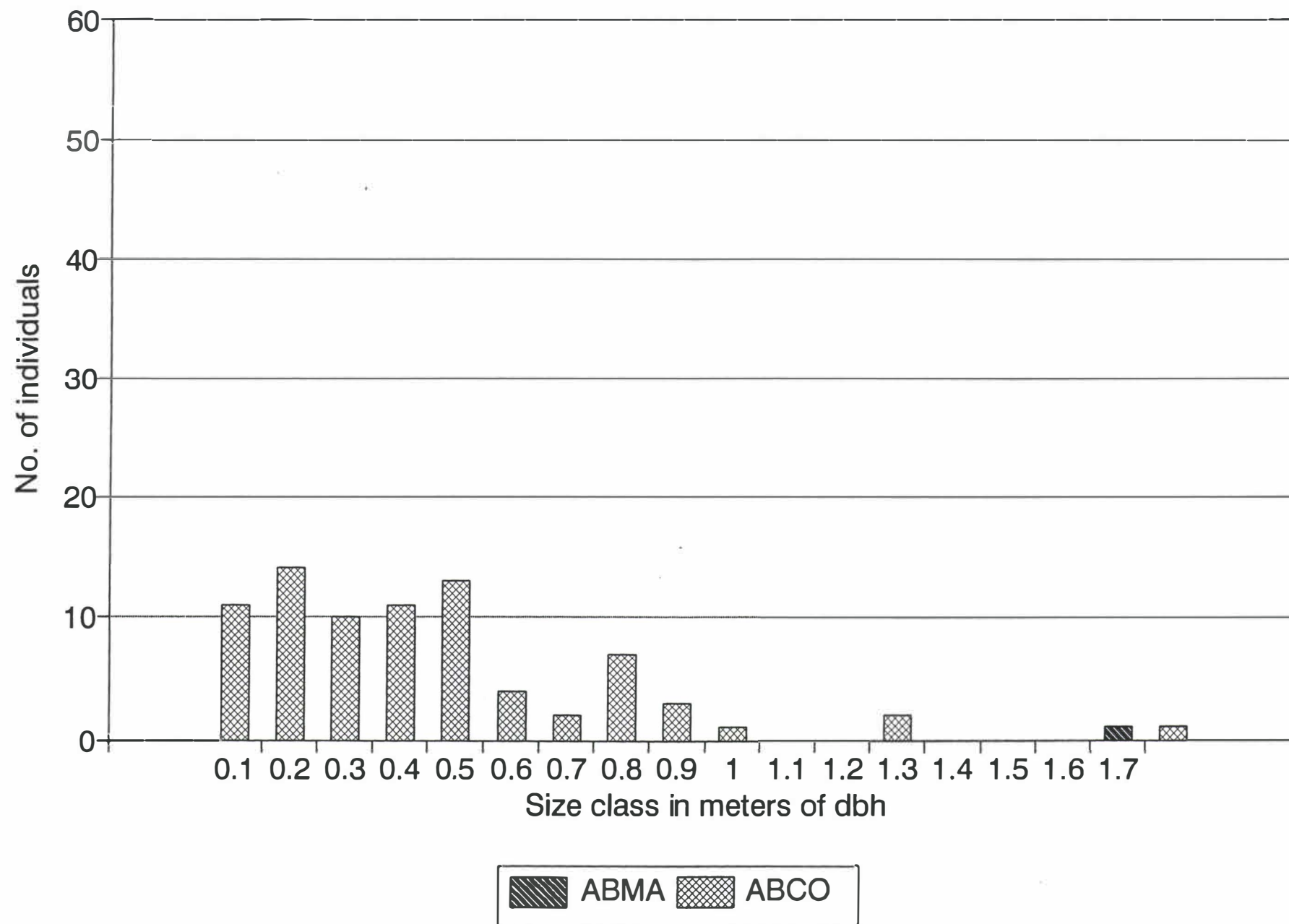
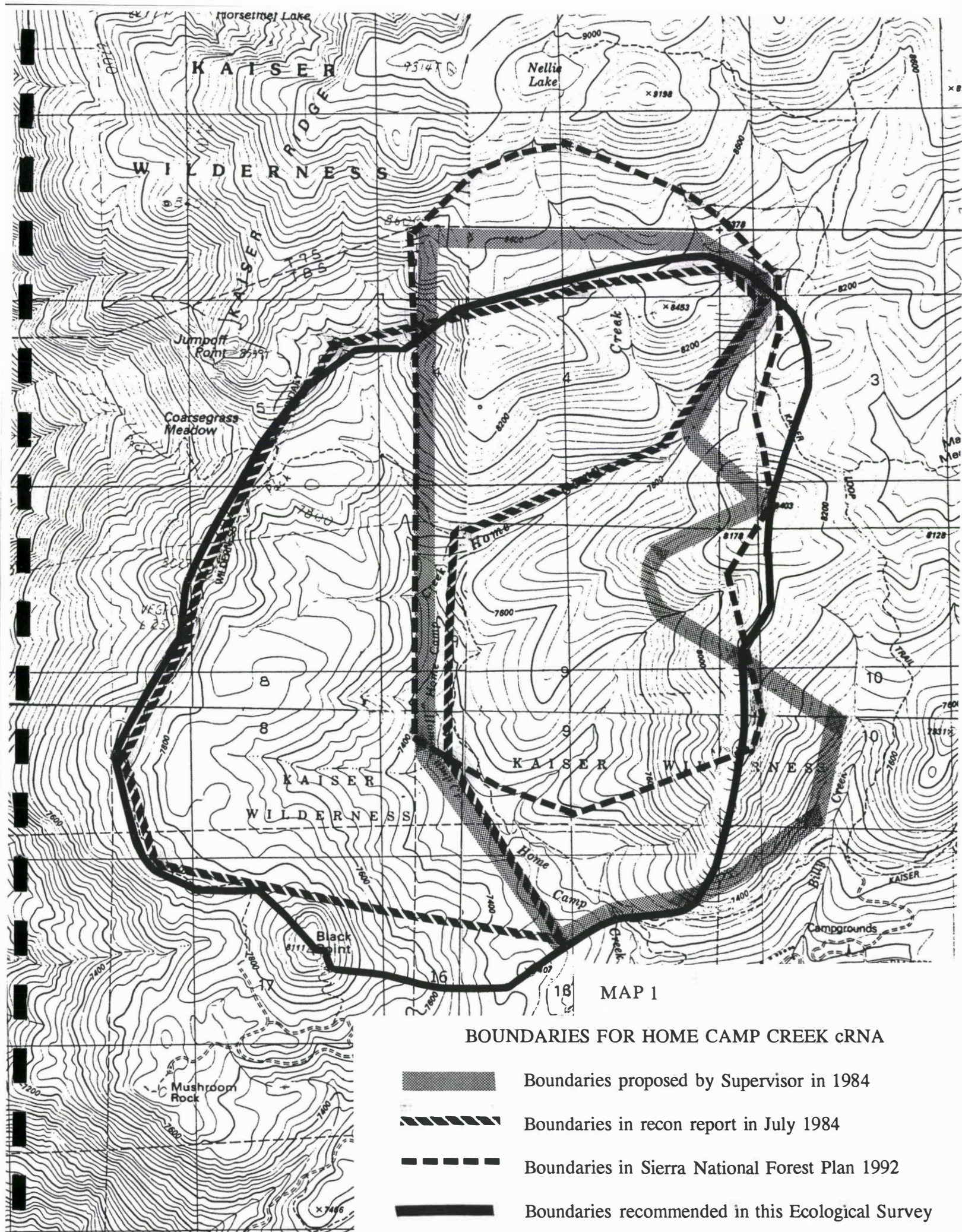


Figure 3

Size distribution of trees Transect 2





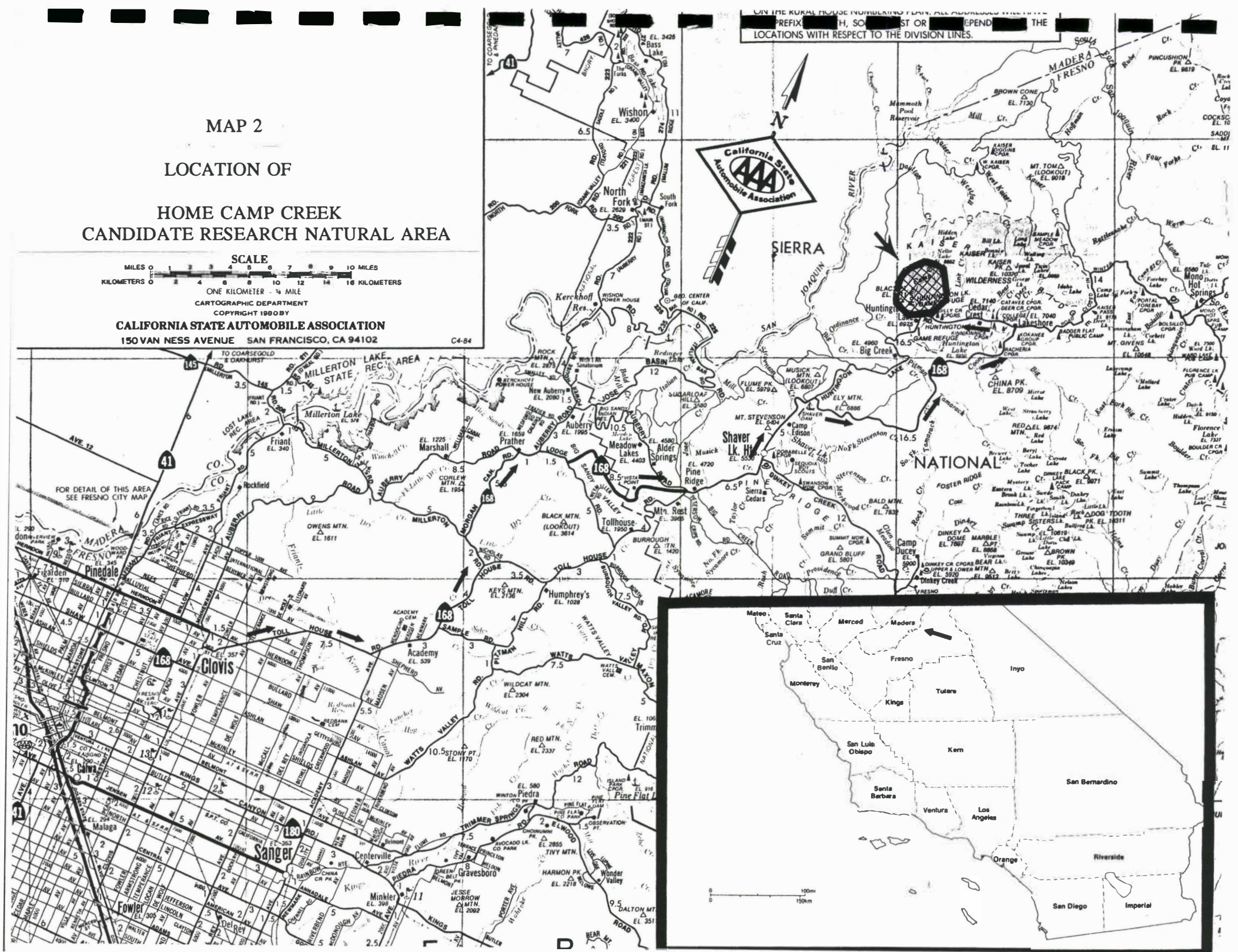
SCALE

MILES 0 1 2 3 4 5 6 7 8 9 10 MILES
KILOMETERS 0 2 4 6 8 10 12 14 16 KILOMETERS

ONE KILOMETER = $\frac{1}{2}$ MILE

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MAP 3

GEOLOGY OF THE HUNTINGTON

LAKE AREA

(Hamilton, 1956)

EXPLANATION



Quaternary

(Qal, non-glacial alluvium; Ql, post-glacial lake deposits; Qm, moraine; Qgm, ground moraine; Qgl, glacial lake deposits; Ok, kames)



Tertiary (?)

(Tb, trachybasalt; Ta, andesite)



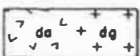
Aplite



Coyote Creek pluton (alaskite)



Rancheria Creek pluton (alaskite)



Dinkey Lake pluton (do, alaskite dg, granite)



Sheepthief Creek pluton (granite)



Red Lake pluton (quartz monzonite)



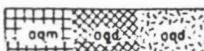
Rodeo Meadow pluton (quartz monzonite)



Mt. Givens pluton (qgm, quartz monzonite; qgd, granodiorite)



Koiser Peak pluton (kqm, quartz monzonite; kgd, granodiorite; kqd, quartz diorite)



Tamarock Creek pluton (aqm, quartz monzonite; agd, granodiorite; aqd, quartz diorite)



Helms Creek pluton (granodiorite)



Huntington Lake pluton (lqd, granodiorite; lqd, quartz diorite)



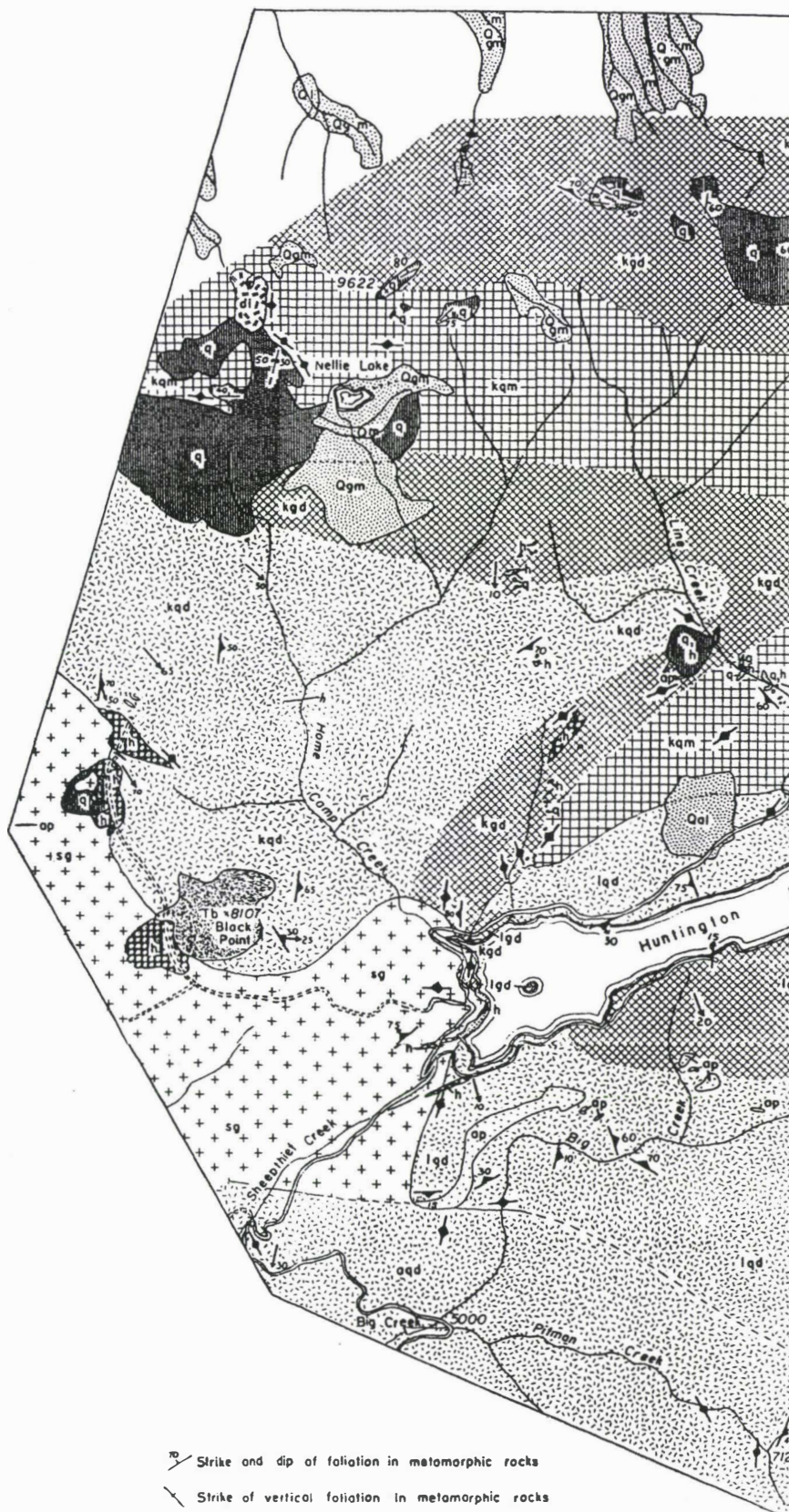
Diorite



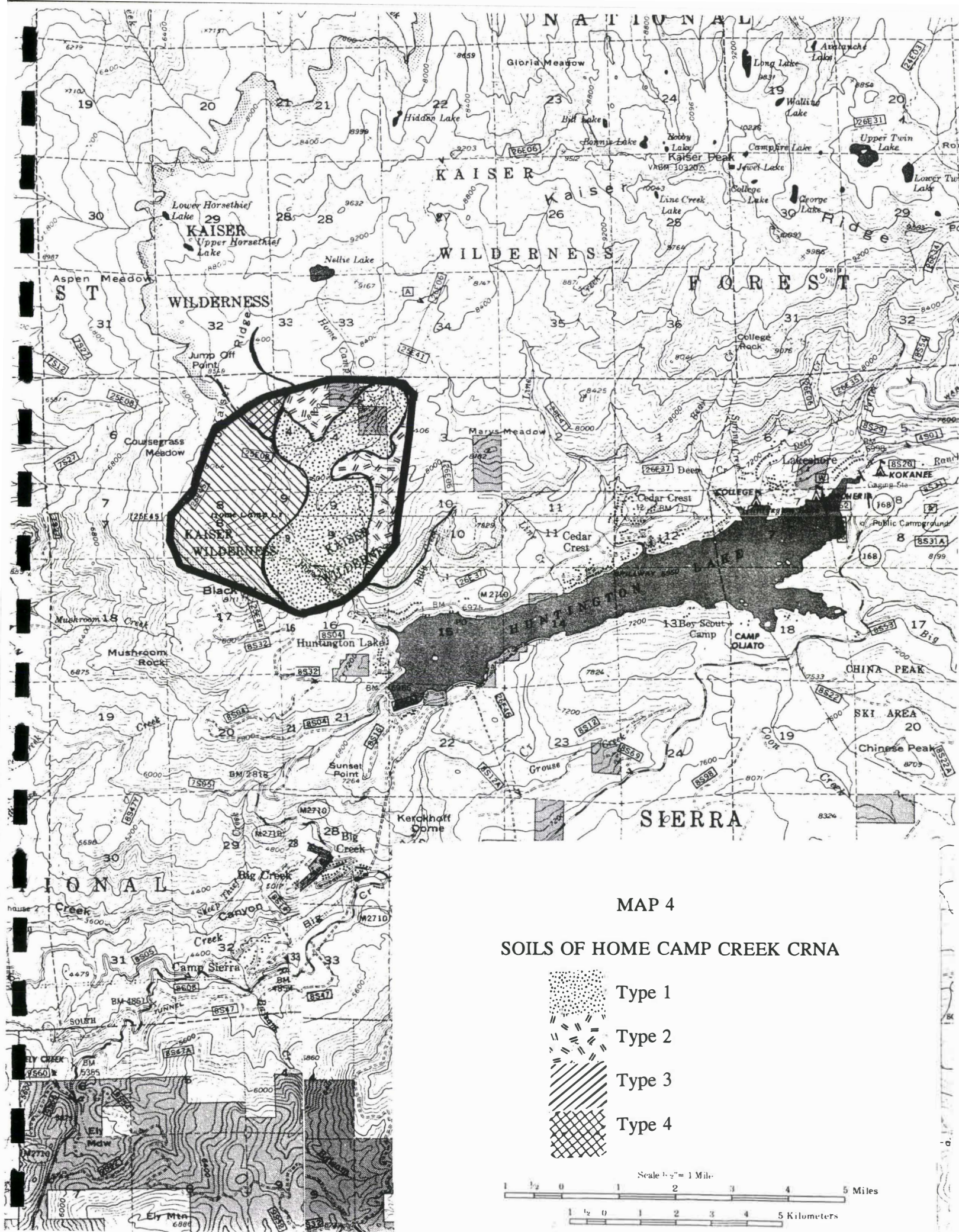
Hybrid rocks

JURASSIC OR CRETACEOUS (?)

Granitic rocks not listed in order of age

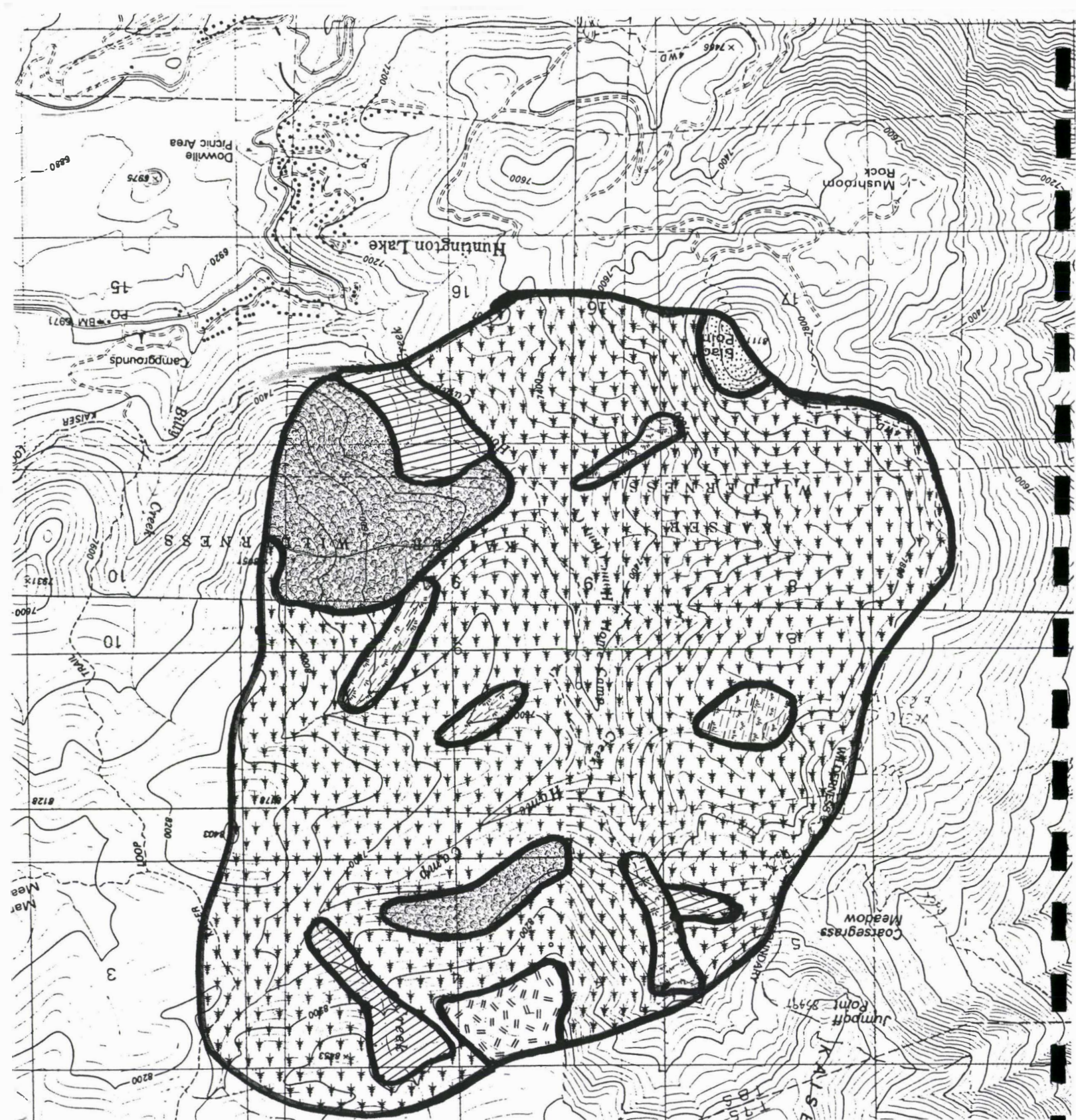


Strike and dip of foliation in metamorphic rocks
Strike of vertical foliation in metamorphic rocks



MAP 5

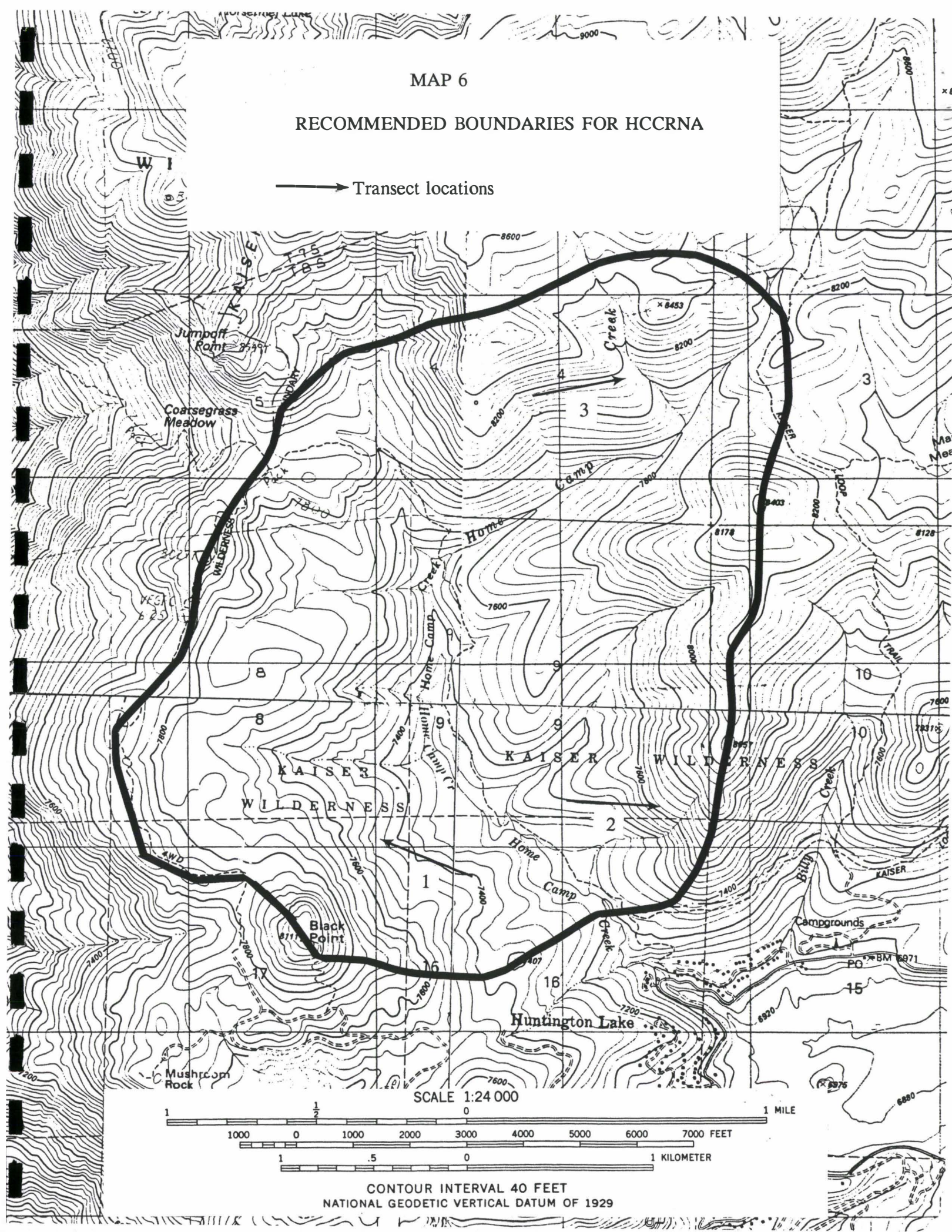
VEGETATION OF HOME CAMP CREEK



MAP 6

RECOMMENDED BOUNDARIES FOR HCCRNA

→ Transect locations



Appendix 1. Vascular Plant Species list

Species observed in Home Camp Creek
July 9-13, 1990 or June 25-28, 1991

Abies concolor
Abies magnifica
Achillea millefolium
Allophyllum integrifolium
Allium campanulatum
Angelica breweri
Antennaria rosea
Apocynum pumilum
Aquilegia formosa var. *truncata*
Arabis Hoelboellii
Arabis platysperma
Arctostaphylos nevadensis
Arctostaphylos patula
Aster alpigenus ssp. *Andersonii*
Aster occidentalis
Astragalus bolanderi
Brodiaea lutea
Bromus carinatus
Calochortus leichtlini
Caltha howelli
Calyptridium umbellatum
Calystegia malacophyllus
Carex exserta
Carex nebrascensis
Carex sp.
Castilleja miniata
Castilleja applegatei
Ceanothus cordulatus
Ceanothus leucodermis
Chaenactis douglasii
Chyrsolepis sempervirens
Cyrsopsis brewerii
Chrysothamnus parryi
Collinsia parvifolia
Collinsia torreyi
Corallorhiza maculata
Cornus occidentalis
Cornus stolonifera
Cystopteris fragilis

Danthonia intermedia
Delphinium pratense
Delphinium sp
Deschampsia elongata
Descurania californica
Dicentra uniflora
Dodecatheon jeffreyi
Eleocharis sp.
Epilobium angustifolium
Epilobium hornemanni/lactiflorum?
Equisetum arvense
Eriogonum nudum
Eriogonum spergulinum
Eriogonum umbellatum
Erysimum capitatum
Erysimum perenne
Fragaria californicum
Gayophytum eriospermum
Gayophytum nutalli
Gilia capillaris
Gilia leptalea
Habenaria dilatata
Habenaria sparsiflora
Hackelia jessicae
Hackelia mundula
Hackelia munzii
Helenium bigelovii
Hieracium albiflorum
Hieracium horridum
Holodiscus microphyllus
Hulsea brevifolia
Hypericum anagalloides
Ipomopsis aggregata
Ivesia unguiculata
Juncus dubius
Juncus ensifolius
Kellogia gallioides
Ledum glandulosa
Lewisia nevadensis
Lilium kelleyanum
Linanthus ciliatus
Lithophragma glabrum
Lonicera conjugialis
Lotus oblongifolia

Lotus purshianus
Lupinus breweri
Lupinus formosus/andersonii
Lupinus polyphyllus ssp. superbus
Luzula parviflora
Malacothrix bolanderi
Melica aristata
Mertensia ciliata
Microsteris gracilis
Mimulus breweri
Mimulus discolor
Mimulus gutatus
Mimulus moshatum
Mimulus primuloides
Mimulus tilingii
Monardella odoratissima
Montia perfoliata
Nemophila spatulata
Osmorhiza chilense
Pedicularis semibarbata
Pellaea brewerii
Penstemon laetus
Perideridia bolanderi
Perideridia parshii?
Phacelia hydrophyloides
Phacelia mutabilis
Phalacroseris bolanderi
Phlox diffusa
Pinus jeffreyi
Pinus lambertiana
Pinus monticola
Pinus murrayana
Poa bolanderi
Polemonium californicum
Polygonum bistortoides
Populus tremuloides
Potentilla glandulosa
Potentilla gracilis
Prunus emarginata
Pteridium aquilinum
Pyrola minor
Pyrola picta
Ranunculus alisaemifolius
Ribes cereum

Ribes nevadense
Ribes roezlii
Ribes viscosissimum
Rumex sp
Salix lemmoni
Sambucus microbotrys
Sanicula graveolens
Sarcodes sanguinea
Senecio arunicoides
Senecio triangularis
Silene montana
Sitanion hystrix
Smilacina racemosa
Stellaria jamesiana
Stipa californica
Stipa occidentalis
Streptanthus tortuosus
Symphoricarpos acutus
Thalictrum fendleri
Thalictrum sparsiflorum
Trifolium monanthum
Vaccinum occidentale
Veratrum californicum
Veronica alpina
Veronica scutellata
Viola macloskeyi
Viola purpurea

Appendix 2. Animals species predicted to occur in Home Camp Creek cRNA.
California Department of Fish and Game Wildlife Habitat Relationship System (Timossi, 1988)

Data Base Version: 04/08/88

SPECIES SUMMARY LIST -- for Red Fir Forest, all stages in Sierra National Forest.

Status Definitions:

- 1 = FE: Federally Endangered
- 2 = FT: Federally Threatened
- 3 = CE: California Endangered
- 4 = CR: California Rare
- 6 = CP: California Protected
- 7 = FS: Forest Service Sensitive
- 8 = BS: BLM Sensitive

* indicates species observed during field survey

ID#	SPECIES NAME	SCIENTIFIC NAME	FAMILY	STATUS
A023	MOUNT LYELL SALAMANDER	Hydromantes platycephalus	PLETHODONTIDAE	
A032	WESTERN TOAD	Bufo boreas	BUFONIDAE	
A039	PACIFIC TREEFROG	Hyla regilla	HYLIDAE	
B076	WOOD DUCK	Aix sponsa	ANATIDAE	
B103	BUFFLEHEAD	Bucephala albeola	ANATIDAE	
* B108	TURKEY VULTURE	Cathartes aura	CATHARTIDAE	
B113	BALD EAGLE	Haliaeetus leucocephalus	ACCIPITRIDAE	1 3 5
B115	SHARP-SHINNED HAWK	Accipiter striatus	ACCIPITRIDAE	
B116	COOPER'S HAWK	Accipiter cooperii	ACCIPITRIDAE	
B117	NORTHERN GOSHAWK	Accipiter gentilis	ACCIPITRIDAE	6
* B123	RED-TAILED HAWK	Buteo jamaicensis	ACCIPITRIDAE	
B126	GOLDEN EAGLE	Aquila chrysaetos	ACCIPITRIDAE	56
B127	AMERICAN KESTREL	Falco sparverius	FALCONIDAE	
B129	PEREGRINE FALCON	Falco peregrinus	FALCONIDAE	1 3 5
B131	PRAIRIE FALCON	Falco mexicanus	FALCONIDAE	6

ID#	SPECIES NAME	SCIENTIFIC NAME	FAMILY	STATUS
B134	BLUE GROUSE	<i>Dendragapus obscurus</i>	PHASIANIDAE	6
* B141	MOUNTAIN QUAIL	<i>Oreortyx pictus</i>	PHASIANIDAE	
B251	BAND-TAILED PIGEON	<i>Columba fasciata</i>	COLUMBIDAE	
B255	MOURNING DOVE	<i>Zenaida macroura</i>	COLUMBIDAE	
B263	FLAMMULATED OWL	<i>Otus flammeolus</i>	STRIGIDAE	
B264	WESTERN SCREECH OWL	<i>Otus kennicottii</i>	STRIGIDAE	
* B265	GREAT HORNED OWL	<i>Bubo virginianus</i>	STRIGIDAE	
B270	SPOTTED OWL	<i>Strix occidentalis</i>	STRIGIDAE	6
B271	GREAT GRAY OWL	<i>Strix nebulosa</i>	STRIGIDAE	3 6
B274	NORTHERN SAW-WHET OWL	<i>Aegolius acadicus</i>	STRIGIDAE	
B276	COMMON NIGHTHAWK	<i>Chordeiles minor</i>	CAPRIMULGIDAE	
B277	COMMON POORWILL	<i>Phalaenoptilus nuttallii</i>	CAPRIMULGIDAE	
B281	VAUX'S SWIFT	<i>Chaetura vauxi</i>	APODIDAE	
* B282	WHITE-THROATED SWIFT	<i>Aeronautes saxatalis</i>	APODIDAE	
B289	CALLIOPE HUMMINGBIRD	<i>Stellula calliope</i>	TROCHILIDAE	
B298	YELLOW-BELLIED SAPSUCKER	<i>Sphyrapicus varius</i>	PICIDAE	
* B299	RED-BREASTED SAPSUCKER	<i>Sphyrapicus ruber</i>	PICIDAE	
B300	WILLIAMSON'S SAPSUCKER	<i>Spyrapicus thyroideus</i>	PICIDAE	
B303	DOWNY WOODPECKER	<i>Picoides pubescens</i>	PICIDAE	
B304	HAIRY WOODPECKER	<i>Picoides villosus</i>	PICIDAE	
B305	WHITE-HEADED WOODPECKER	<i>Picoides albolarvatus</i>	PICIDAE	
B306	BLACK-BACKED WOODPECKER	<i>Picoides arcticus</i>	PICIDAE	
B307	NORTHERN FLICKER	<i>Colaptes auratus</i>	PICIDAE	
B308	PILEATED WOODPECKER	<i>Dryocopus pileatus</i>	PICIDAE	
B309	OLIVE-SIDED FLYCATCHER	<i>Contopus borealis</i>	TYRANNIDAE	
B311	WESTERN WOOD-PEWEE	<i>Contopus sordiolus</i>	TYRANNIDAE	
B317	HAMMONDS'S FLYCATCHER	<i>Empidonax hammondii</i>	TYRANNIDAE	
B318	DUSKY FLYCATCHER	<i>Empidonax oberholseri</i>	TYRANNIDAE	
B344	BARN SWALLOW	<i>Hirundo rustica</i>	HIRUNDINIDAE	
* B346	STELLER'S JAY	<i>Cyanocitta stelleri</i>	CORVIDAE	
* B350	CLARK'S NUTCRACKER	<i>Nucifraga columbiana</i>	CORVIDAE	
* B354	COMMON RAVEN	<i>Corvus corax</i>	CORVIDAE	
* B356	MOUNTAIN CHICKADEE	<i>Parus gambeli</i>	PARIDAE	
B361	RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>	SITTIDAE	
B362	WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>	SITTIDAE	
B364	BROWN CREEPER	<i>Certhia americana</i>	CERTHIIDAE	
B369	HOUSE WREN	<i>Troglodytes aedon</i>	TROGLODYTIDAE	

ID#	SPECIES NAME	SCIENTIFIC NAME	FAMILY	STATUS
B370	WINTER WREN	Troglodytes troglodytes	TROGLODYTIDAE	
B375	GOLDEN-CROWNED KINGLET	Regulus satrapa	MUSCICAPIDAE	
B376	RUBY-CROWNED KINGLET	Regulus calendula	MUSCICAPIDAE	
B380	WESTERN BLUEBIRD	Sialia mexicana	MUSCICAPIDAE	
B381	MOUNTAIN BLUEBIRD	Sialia currucoides	MUSCICAPIDAE	
* B382	TOWNSEND'S SOLITAIRE	Myadestes townsendi	MUSCICAPIDAE	
B385	SWAINSON'S THRUSH	Catharus ustulatus	MUSCICAPIDAE	
* B386	HERMIT THRUSH	Catharus guttatus	MUSCICAPIDAE	
* B389	AMERICAN ROBIN	Turdus migratorius	MUSCICAPIDAE	
* B390	VARIED THRUSH	Ixoreus naevius	MUSCICAPIDAE	
B415	SOLITARY VIREO	Vireo solitarius	VIREONIDAE	
B418	WARBLING VIREO	Vireo gilvus	VIREONIDAE	
B425	ORANGE-CROWNED WARBLER	Vermivora celata	EMBERIZIDAE	
B426	NASHVILLE WARBLER	Vermivora ruficapilla	EMBERIZIDAE	
B430	YELLOW WARBLER	Dendroica petechia	EMBERIZIDAE	
B435	YELLOW-RUMPED WARBLER	Dendroica coronata	EMBERIZIDAE	
B436	BLACK-THROATED GRAY WARBLER	Dendroica nigrescens	EMBERIZIDAE	
B438	HERMIT WARBLER	Dendroica occidentalis	EMBERIZIDAE	
B463	WILSON'S WARBLER	Wilsonia pusilla	EMBERIZIDAE	
B471	WESTERN TANAGER	Piranga ludoviciana	EMBERIZIDAE	
B482	GREEN-TAILED TOWHEE	Pipilo chlorurus	EMBERIZIDAE	
B489	CHIPPING SPARROW	Spizella passerina	EMBERIZIDAE	
B504	FOX SPARROW	Passerella iliaca	EMBERIZIDAE	
B509	GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla	EMBERIZIDAE	
B510	WHITE-CROWNED SPARROW	Zonotrichia leucophrys	EMBERIZIDAE	
* B512	DARK-EYED JUNCO	Junco hyemalis	EMBERIZIDAE	
B521	WESTERN MEADOWLARK	Sturnella neglecta	EMBERIZIDAE	
B524	BREWER'S BLACKBIRD	Euphagus cyanocephalus	EMBERIZIDAE	
B528	BROWN-HEADED COWBIRD	Molothrus ater	EMBERIZIDAE	
B535	PINE GROSBEAK	Pinicola enucleator	FRINGILLIDAE	
B537	CASSIN'S FINCH	Carpodacus cassinii	FRINGILLIDAE	
B539	RED CROSSBILL	Loxia curvirostra	FRINGILLIDAE	
B542	PINE SISKIN	Carduelis pinus	FRINGILLIDAE	
B543	LESSER GOLDFINCH	Carduelis psaltria	FRINGILLIDAE	
B546	EVENING GROSBEAK	Coccothraustes vespertinus	FRINGILLIDAE	
M004	DUSKY SHREW	Sorex monticolus	SORICIDAE	
M010	WATER SHREW	Sorex palustris	SORICIDAE	

ID#	SPECIES NAME	SCIENTIFIC NAME	FAMILY	STATUS
M012	TROWBRIDGE'S SHREW	<i>Sorex trowbridgii</i>	SORICIDAE	
M018	BROAD-FOOTED MOLE	<i>Scapanus latimanus</i>	TALPIDAE	
M021	LITTLE BROWN MYOTIS	<i>Myotis lucifugus</i>	VESPERTILIONIDAE	
M023	YUMA MYOTIS	<i>Myotis yumanensis</i>	VESPERTILIONIDAE	
M025	LONG-EARED MYOTIS	<i>Myotis evotis</i>	VESPERTILIONIDAE	
M026	FRINGED MYOTIS	<i>Myotis thysanodes</i>	VESPERTILIONIDAE	
M027	LONG-LEGGED MYOTIS	<i>Myotis volans</i>	VESPERTILIONIDAE	
M028	CALIFORNIA MYOTIS	<i>Myotis californicus</i>	VESPERTILIONIDAE	
M030	SILVER-HAIRED BAT	<i>Lasionycterus noctivigans</i>	VESPERTILIONIDAE	
M032	BIG BROWN BAT	<i>Eptesicus fuscus</i>	VESPERTILIONIDAE	
M034	HOARY BAT	<i>Lasiurus cinereus</i>	VESPERTILIONIDAE	
M037	TOWNSEND'S BIG-EARED BAT	<i>Plecotus townsendii</i>	VESPERTILIONIDAE	
M039	BRAZILIAN FREE-TAILED BAT	<i>Tadarida brasiliensis</i>	MOLOSSIDAE	
M043	PIKA	<i>Ochotona princeps</i>	OCHOTONIDAE	
M049	SNOWSHOE HARE	<i>Lepus americanus</i>	LEPORIDAE	
M050	WHITE-TAILED HARE	<i>Lepus townsendii</i>	LEPORIDAE	
M051	BLACK-TAILED HARE	<i>Lepus californicus</i>	LEPORIDAE	
M052	MOUNTAIN BEAVER	<i>Aplodontia rufa</i>	APLODONTIDAE	
M055	YELLOW-PINE CHIPMUNK	<i>Tamias amoenus</i>	SCIURIDAE	
M057	ALLEN'S CHIPMUNK	<i>Tamias senex</i>	SCIURIDAE	
* M063	LODGEPOLE CHIPMUNK	<i>Tamias speciosus</i>	SCIURIDAE	
M066	YELLOW-BELLIED MARMOT	<i>Marmota flaviventris</i>	SCIURIDAE	
M070	BELDING'S GROUND SQUIRREL	<i>Spermophilus beldingi</i>	SCIURIDAE	
M072	CALIFORNIA GROUND SQUIRREL	<i>Spermophilus beecheyi</i>	SCIURIDAE	
M075	GOLDEN-MANTLED GROUND SQUIRREL	<i>Spermophilus lateralis</i>	SCIURIDAE	
* M079	DOUGLAS' SQUIRREL	<i>Tamiasciurus douglasii</i>	SCIURIDAE	
M080	NORTHERN FLYING SQUIRREL	<i>Glaucomys sabrinus</i>	SCIURIDAE	
M081	BOTTA'S POCKET GOPHER	<i>Thomomys bottae</i>	GEOMYIDAE	
M085	MOUNTAIN POCKET GOPHER	<i>Thomomys monticola</i>	GEOMYIDAE	
M113	WESTERN HARVEST MOUSE	<i>Reithrodontomys megalotis</i>	CRICETIDAE	
* M117	DEER MOUSE	<i>Peromyscus maniculatus</i>	CRICETIDAE	
M128	BUSHY-TAILED WOODRAT	<i>Neotoma cinerea</i>	CRICETIDAE	
M130	HEATHER VOLE	<i>Phenacomys intermedius</i>	CRICETIDAE	
M133	MONTANE VOLE	<i>Microtus montanus</i>	CRICETIDAE	
M136	LONG-TAILED VOLE	<i>Microtus longicaudus</i>	CRICETIDAE	
M143	WESTERN JUMPING MOUSE	<i>Zapus princeps</i>	ZAPODIDAE	
M145	PORCUPINE	<i>Erethizon dorsatum</i>	ERETHIZONTIDAE	

ID#	SPECIES NAME	SCIENTIFIC NAME	FAMILY	STATUS
M146	COYOTE	<i>Canis latrans</i>	CANIDAE	
M147	RED FOX	<i>Vulpes vulpes</i>	CANIDAE	
* M151	BLACK BEAR	<i>Ursus americanus</i>	URSIDAE	
M153	RACCOON	<i>Procyon lotor</i>	PROCYONIDAE	
M154	MARTEN	<i>Martes americana</i>	MUSTELIDAE	
M155	FISHER	<i>Martes pennanti</i>	MUSTELIDAE	
M156	ERMINE	<i>Mustela erminea</i>	MUSTELIDAE	
M157	LONG-TAILED WEASEL	<i>Mustela frenata</i>	MUSTELIDAE	
M159	WOLVERINE	<i>Gulo gulo</i>	MUSTELIDAE	
M160	BADGER	<i>Taxidea taxus</i>	MUSTELIDAE	
M161	WESTERN SPOTTED SKUNK	<i>Spilogale gracilis</i>	MUSTELIDAE	
M162	STRIPED SKUNK	<i>Mephitis mephitis</i>	MUSTELIDAE	
M165	MOUNTAIN LION	<i>Felis concolor</i>	FELIDAE	
M166	BOBCAT	<i>Lynx rufus</i>	FELIDAE	
* M181	MULE DEER	<i>Odocoileus hemionus</i>	CERVIDAE	
R042	NORTHERN ALLIGATOR LIZARD	<i>Gerrhonotus coeruleus</i>	ANGUIDAE	
R046	RUBBER BOA	<i>Charina bottae</i>	BOIDAE	
R062	WESTERN TERRESTRIAL GARTER SNAKE	<i>Thamnophis elegans</i>	COLUBRIDAE	
R076	WESTERN RATTLESNAKE	<i>Crotalus viridis</i>	VIPERIDAE	

PHOTO CAPTIONS

1. Home Camp Creek. Small pools and riffles are common.
2. Mature red fir forest. Jump Off Point in background.
3. Western portion of HCCRNA as viewed from Black Point. Jump Off Point is the prominent granite outcrop.
4. Main portion of HCCRNA as viewed from Black Point. Peak adjacent to Nellie Lake in distance.
5. Huntington Lake as viewed from Black Point.
6. Regeneration in vicinity of Transect # 3.
7. Red fir forest with mixed size distribution.
8. Open, mixed stand of jeffrey pine, white fir and red fir on ridge which forms western boundary of HCCRNA.
9. *Hulsea brevifolia* -- a CNPS list 4 species.
10. Meadow in upper Home Camp Creek Basin. Note dead lodgepole pines around the margin.
11. Scars from 1988 Lake Fire. Photo taken in July 1990.
12. Damage from 1988 Lake Fire. Photo taken in July 1990.
13. Damage from 1988 Lake Fire. Photo taken in July 1990.

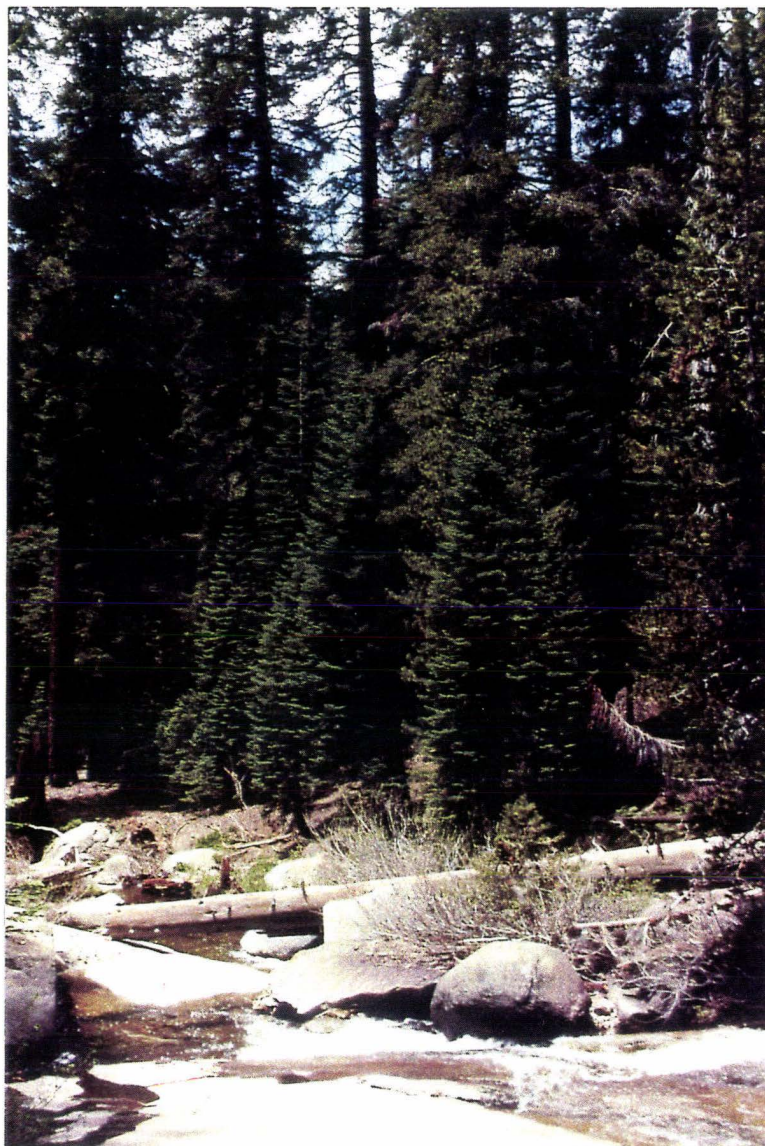


PHOTO 1



PHOTO 2



PHOTO 3



PHOTO 4

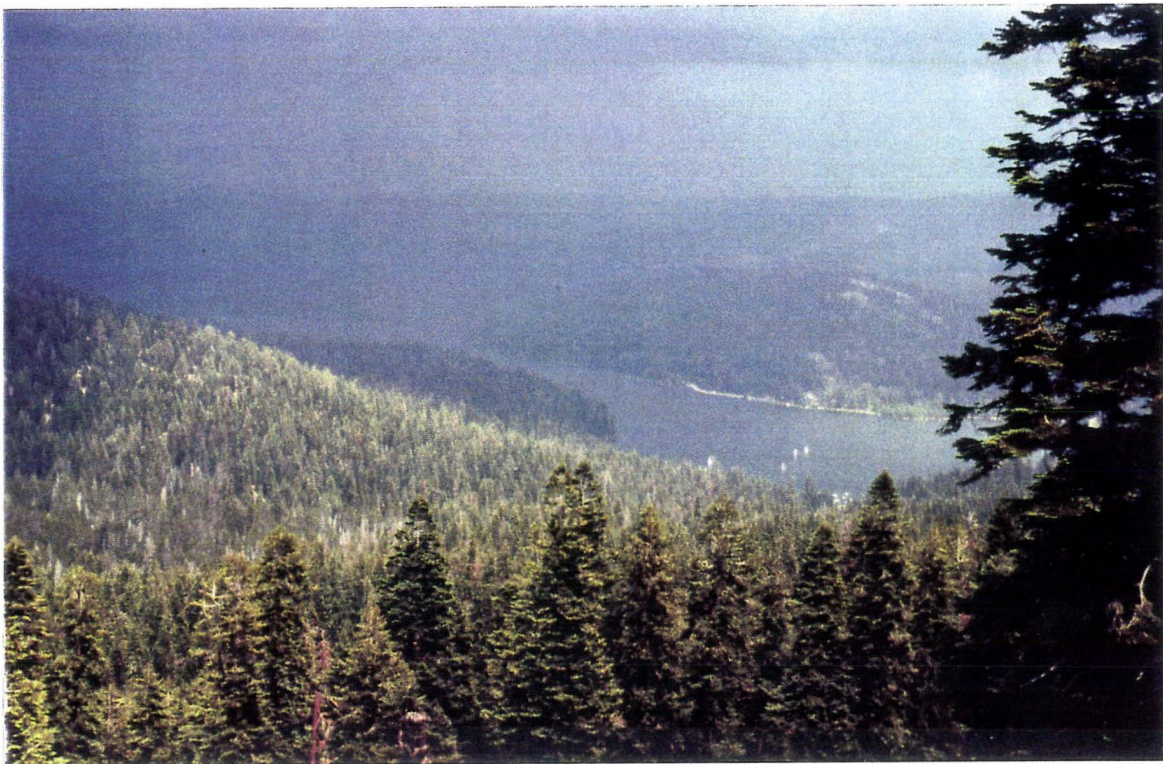


PHOTO 5



PHOTO 6



PHOTO 7



PHOTO 8



PHOTO 9



PHOTO 10



PHOTO 11



PHOTO 13

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